

REMARKS

The rejections under 35 U.S.C. § 103(a) of Claims 1, 2, 6, 8, 9, 10, 13 and 14 as unpatentable over U.S. 4,748,993 (Llewellyn) alone, and of Claims 4, 5, and 12 as unpatentable over Llewellyn, and further in view of U.S. 6,018,000 (Keeny et al), are respectfully traversed.

As described in the specification, it is customary in the art to construct the frames of dish racks for dishwashers with steel wire, and to coat these racks with an anti-corrosive made of organic polymers, wherein the surfaces of such coatings are generally smooth, because the user assumes that no residual foreign matter will stick to these surfaces. When washing is finished, drops of water usually remain on the contact points where the dishes rest on the rack and do not vaporize easily, thereby requiring increased power consumption in order to vaporize the drops and dry the dishes quickly, which are still wet.

The present invention addresses this problem, by configuring the coating such that the water drops are distributed over a surface of the coating in the form of a substantially uniform film, wherein the surface of the coating has a surface roughness of  $R_z \geq 5 \mu\text{m}$ .

Neither Llewellyn nor Keeny et al, alone or in combination, disclose or suggest the presently-claimed invention.

Llewellyn discloses nothing more than what Applicants have already acknowledged is known in the art, i.e., a dishwasher apparatus comprising a dish rack having a frame made of steel wire and coated with a plastic coating. Keeny et al is relied on for a disclosure of polyamide based powder coatings to provide, for example, corrosion protection to steel, and wherein such coatings can be used for dishwasher baskets (column 4, lines 17-30).

The Examiner recognizes that the applied prior art discloses neither the presently-recited coating configuration nor surface roughness, but finds that the recited configuration "is merely functional;" that nevertheless the limitation is met inherently when the dishwasher

is in use, due to the "circular" shape of the rods [of the frame]; that "a single drop may be considered to define a uniform film;" that the claims do not require that the uniform film be distributed over the "entire" (Examiner's emphasis) surface of the coating, and that the surface roughness would have been determined "through routine experimentation and optimization, thereby decreasing the risk of corrosion."

In reply, a "functional" limitation is still a limitation, and cannot be ignored.

Regarding the Examiner's finding of inherency, it is clear that to the extent that the above-amended claims read on the dishwasher when in use, the recited configuration manifests itself generally toward the end of a complete cycle, i.e., especially during the drying cycle. To the extent water is distributed over an upper surface of the coating and frame during the wash cycle of a dishwasher, as found by the Examiner, it is due to the amount and pressure of the water, not the configuration of the coating.

Regarding the Examiner's finding that a single drop may be considered to define a uniform film, it is moot in view of the above-discussed amendment, which requires that **drops** form a film.

Nor do the present claims require that the uniform film be distributed over the entire surface of the coating; so long as drops are distributed to form a substantially uniform film, this subject matter is covered by the claims.

Regarding the Examiner's finding on surface roughness, the Examiner relies on Figure 3 of Llewellyn to find that "the coating is smooth." In reply, arguments based on mere measurement of patent drawings are of little value in the absence of a description in the specification of relative dimensions. *In re Chitayat*, 161 USPQ 224 (CCPA 1969) (**copy enclosed**). Similarly, no findings can be made with regard to surface smoothness in Llewellyn from the figures therein, since there is no description of smoothness. Nevertheless, the presently-recited average roughness limitation feels smooth, as described at [0010] of the

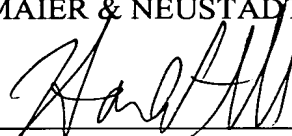
specification, and yet provides the above-discussed advantages. The Examiner assumes that surface roughness is a result-effective variable, but no support has been offered for this finding. See *In re Antonie*, 195 USPQ 6, 8-9 (CCPA 1977) (**copy enclosed**) (exceptions to rule that optimization of a result-effective variable is obvious, such as where the variable was not recognized to be result effective). In addition, the Examiner assumes that there is a relationship between surface roughness and corrosion, while again, there is no evidentiary support therefor. Indeed, the surface roughness limitation by itself herein indicates patentability, because none of the applied prior art recognizes its significance nor can it be reasonably found that such surface roughness is inherent in the art.

For all the above reasons, it is respectfully requested that the rejections over prior art be withdrawn.

All of the presently pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



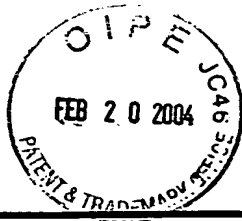
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**In re CHITAYAT****(CCPA)****161 USPQ 224****Decided Apr. 3, 1969****No. 8125****U.S. Court of Customs and Patent Appeals**

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**Headnotes****PATENTS****1. Drawings—In general (§ 34.1)**

Arguments based on mere measurement of patent drawings are of little value in absence of description in specification of relative dimensions.—In re Chitayat (CCPA) 161 USPQ 224 .

**Particular patents—Image Enhancement**

Chitayat, Image Enhancement Means, claims 7 to 10 of application refused.—In re Chitayat (CCPA) 161 USPQ 224 .

**RECEIVED****FEB 25 2004****Case History and Disposition:****GROUP 3600****Appeal from Board of Appeals of the Patent Office.**

Application for patent of Anwar K. Chitayat, Serial No. 266,730, filed Mar. 20, 1963; Patent Office Group 250. From decision rejecting claims 7 to 10, applicant appeals. Affirmed.

**Attorneys:**

**JOHN C. VASSIL (THOMAS P. DOWLING of counsel) both of New York, N. Y., for appellant.**

**JOSEPH SCHIMMEL (JERE W. SEARS of counsel) for Commissioner of Patents.**

**Judge:**

Before WORLEY, Chief Judge, and RICH, ALMOND, and BALDWIN, Associate Judges.

## Opinion Text

### Opinion By:

BALDWIN, Judge.

This appeal is from the Patent Office Board of Appeals decision affirming the rejection of all the claims of appellant's application <sup>1</sup> under 35 U.S.C. 103.

### THE INVENTION

Appellant's invention relates to the field of fiber optics wherein optical images are transmitted along flexible bundles of light-transmitting fibers. Appellant acknowledges that it has previously been known to impart a cyclic displacement of the image relative to the fibers to ensure that all parts of the image are presented at one time or another to intact fibers for transmission along the bundle, thus avoiding degradation of the received image due to elements of the image being lost in the spaces between adjacent fibers or along broken fibers. Appellant's invention resides in providing a displacement of the image which amounts to at least one hundred fiber diameters to cause an alleged improvement in the quality of the transmitted image.

Claim 7, which is reproduced as follows, is typical of the claims on appeal, and the patentability of it is determinative of all issues in this appeal.

7. A coherent image transmitting system comprising an optical fibre bundle having physically separate variably oriented ends and transmission improving means for improving the effective resolution of the transmitted image and eliminating the effect of broken fibres independent of the relative orientation of said ends comprising image displacing means at each of said ends for imparting a displacement of the respective image, said displacing means being configured whereby the driving thereof causes elements of said image to be displaced

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by at least one hundred fibre diameters for eliminating the effect of defective fibers without causing excessive transmission losses, and control means for synchronizing the operation of said displacing means with respect to both speed and phase relationship whereby said image displacements are effectively nullified, said control means comprising a plurality of separate drive means, one couple to each of the image displacing means at said fibre bundle ends for cyclically driving said displacing means, means for synchronizing the speed of each of said drive means and means for fixing the phase of each of said drive means.

### THE REFERENCES

Frank <sup>2</sup> discloses a fiber-optic, light transmitting system which, in its Figure 4 embodiment, includes generally the same structural features for displacing the image relative to the fibers as appellant employs. Frank's specification does not, however, give numerical values for the image displacement in terms of multiples of fiber diameters or the equivalent.

Kapany <sup>3</sup> shows another fiber optic system of the same general type as Frank involving image displacement, and refers explicitly to the magnitude of displacement, stating:

By experimentation, it has been found that an amplitude of four or five diameters resulted in considerable gain in resolution for the transmission of images, amplitudes greater than four diameters had no appreciable increase in resolution, and amplitudes of less than four resulted in a proportionate lessening of the resolution which could be measured. \* \* \*

Kapany illustrates the effect of his range of image displacement on quality by the following

figures:

*Tabular, graphic, or textual material set at this point is not available. Please consult hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

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Figure 5 shows a target image to be transmitted, Figure 7 shows the same image as received without image displacement and Figure 9 shows the received image with image displacement in the range taught by Kapany.

Jones<sup>4</sup> and Fayerweather<sup>5</sup> both show the use of circuit-controlled separate synchronous motors which operate two rotating optical elements in both speed and phase synchronism. Figure 1 of the Jones patent shows two motion picture projectors driven by synchros 29 and 30 with a phase control at 32. Fayerweather discloses two rotating shutters driven by synchronous motors which are connected to a common alternating current source.

### THE REJECTION

Claims 7-10 are rejected under 35 U.S.C. 103 as unpatentable over Frank with Kapany. The examiner contended that Frank disclosed the broad combination claimed by appellant and that:

[I]t is obvious that one skilled in the art could provide a displacement of 100 [sic] at least 100 fiber diameters in the Frank device without producing any unexpected results. \* \* \*

In an additional rejection of claims 9 and 10 under 35 U.S.C. 103 on Frank and Kapany (as applied above) further in view of either Jones or Fayerweather, the examiner stated:

[I]t is considered that it would be obvious to use synchronous motors such as shown in either Fayerweather or Jones to drive the image shifters in the Frank device since the results would be entirely expected.

Affirming the examiner, the board stated:

In addition, it seems to us that a person ordinarily skilled in the art would examine a cable to ascertain the quality thereof. If a bundle of thirty-six fibers were found to be broken, as in appellant's exhibit, it would be obvious that merely displacing the image by four fiber diameters would not effect any improve

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ment. Thus, it is obvious, statistically, that the image displacement should considerably exceed the size of the break. This being so, we find nothing critical and unobvious in the use of one hundred fiber diameters.

### OPINION

On appeal, the solicitor refers to measurements made by him from the drawings of Frank of the relative dimensions of the fibers and image displacement, and then by process of arithmetic deduces that Frank shows a relative image displacement of 45 fiber diameters. Thereafter the solicitor argues:

There is of record no evidence that a nutation circle circumference of 100 fibre diameters will produce a resolution differing more than in degree from the resolution produced by a nutation circle circumference of 45 fibre diameters.

Appellant in refutation of the solicitor's argument, finds the relative dimensions from the

drawings to be different with a corresponding reduction in the relative displacement value.

[1] In view of the absence in Frank's specification of any written description of the quantitative value of the image displacement relative to fiber diameter, the arguments based on mere measurement of the drawings appear to us of little value. As we said when faced with an analogous situation in *In re Wilson et al.*, 50 CCPA 827, 312 F.2d 449, 136 USPQ 188, 192:

Both the Patent Office and appellants have engaged in what appears to us to be a somewhat futile attempt to measure the thickness of the Weisse coil strip and the Weisse lap spacing in their respective attempts to show whether the particular lap spacing recitations included in the claims now before us are or are not distinguishable from those disclosed by Weisse. Appellants, for example, conclude, in typically precise fashion, that the Weisse lap spacing is "about 30% to 60% greater than applicants' top spacing." Patent drawings are not working drawings and this argument is predicated, moreover, on a greatly enlarged section of a small drawing obviously never intended to show the dimensions of anything. We do not find it persuasive.

Thus, in the absence of explicit numerical teaching in Frank relating image displacement to fiber diameter, we turn to the Kapany patent to see whether the values there stated would make the values used by appellant obvious. On this point appellant draws particular attention to the latter part of the previously quoted portion of Kapany that " \* \* \* amplitudes greater than four diameters had no appreciable increase in resolution \* \* \* ." This statement, appellant argues, is a teaching away from use of displacements in excess of four diameters which would make it unobvious to operate at appellant's claimed displacement of at least one hundred fiber diameters.

However, the examiner in his Answer, takes the position that Kapany does not affirmatively teach a *decline* in quality above four diameters but merely infers that a law of diminishing returns may operate after the initial improvement, if displacement is thereafter progressively increased. <sup>6</sup>

This position of the examiner seems to be supported by consideration of the previously reproduced Figures 5, 7 and 9 of Kapany which make it clear that the problem of improving image quality is solved in major part just by moving from a static condition to even the initial, relatively low, amplitude of displacement disclosed by Kapany. Adopting therefore the examiner's position that Kapany does not affirmatively teach away from amplitudes greater than four, it appears that appellant's range of one hundred fiber diameters is a change in degree from the Kapany range.

A review of the record here, however, fails to reveal any results that would not be expected in view of the Kapany teachings. The record includes two exhibits, A and B, showing images of a page of a tool catalog received along the same damaged fiber optic cable under conditions of *no* image displacement and of displacement of "about 200 diameters." Although the improvement in picture quality is quite dramatic, the exhibits are less than convincing because of a failure to provide a comparison

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with the prior art. First, the comparison is with no displacement at all, and a major part of the improvement may be the result of having at least some lower degree of displacement as taught by Kapany. Second, the improved image of the second exhibit was obtained at twice the claimed lower limit of one hundred diameters. The record thus fails to show any unexpected improvement in image quality over that which would be expected in view of the cited references at a minimum displacement of one hundred fiber diameters.

From the foregoing, we believe the rejection of the claims under 35 U.S.C. 103 as being obvious in view of the cited prior art was correct, and the decision of the board is therefore

*affirmed.*

### Footnotes

Footnote 1. Serial No. 266,730, filed March 20, 1963, for "Image Enhancement Means," allegedly a continuation-in-part of serial No. 116,179, filed June 9, 1961.

Footnote 2. U. S. Patent No. 3,110,762, issued November 12, 1963.

Footnote 3. U. S. Patent No. 3,016,785, issued January 16, 1962.

Footnote 4. U. S. Patent No. 2,843,005, issued July 15, 1958.

Footnote 5. U. S. Patent No. 2,166,947, issued July 25, 1939.

Footnote 6. For example, the examiner's Answer states:

Kapany merely states that there is no material improvement in the image when the displacement goes beyond four or five fiber diameters. Statistically the Kapany teaching is correct because if there is one broken fiber in a group of four an elemental image area the size of the fiber end would be transmitted approximately 75% of the time. At a displacement of five fiber diameters such area would be transmitted approximately 80% of the time. In other words the improvement is rapid (0 to 75%) up to a displacement of four fiber diameters, but beyond four diameters the improvement tapers off rapidly.

**- End of Case -**



In re Antonie, 195 USPQ 6 (CCPA 1977)

**In re Antonie**

**(CCPA)  
195 USPQ 6**

**Decided Aug. 18, 1977**

**No. 76-681**

**U.S. Court of Customs and Patent Appeals**

### **Headnotes**

#### **PATENTS**

##### **1. Patentability -- Invention -- In general (§ 51.501)**

Court of Customs and Patent Appeals must first delineate invention as whole in determining whether invention as whole would have been obvious under 35 U.S.C. 103; it looks not only to subject matter that is literally recited in claim in question but also to those properties of subject matter that are inherent in subject matter and are disclosed in specification, in delineating invention as whole; just as chemical and its properties are looked to when obviousness of composition of matter claim is examined for obviousness, invention as whole, not some part of it, must be obvious under Section 103.

##### **2. Patentability -- Invention -- In general (§ 51.501)**

Controlling question in determining obviousness is simply whether differences between prior art and invention as whole are such that invention as whole would have been obvious.

##### **3. Patentability -- Invention -- In general (§ 51.501)**

Standard of 35 U.S.C. 103 is not that it would be obvious for one of ordinary skill in art to try invention; disregard for unobviousness of results of "obvious to try" experiments disregards "invention as a whole" concept of Section 103, and overemphasis on routine nature of data gathering required to arrive at applicant's discovery, after its existence became expected, overlooks last sentence of Section 103.

**4. Patentability -- Change -- In general (§ 51.251)**

**Patentability -- Invention -- In general (§ 51.501)**

Exception to rule that discovery of optimum value of variable in known process is normally obvious occurs when parameter optimized was not recognized to be result effective variable.

**Particular patents -- Contactor Apparatus**

Antonie, Rotating Biological Contactor Apparatus, rejection of claims 1-3 reversed.

**Case History and Disposition:**

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Appeal from Patent and Trademark Office Board of Appeals.

Application for patent of Ronald L. Antonie, Serial No. 331,796, filed Feb. 12, 1973. From decision rejecting claims 1-3, applicant appeals. Reversed; Miller, Judge, concurring in result; Maletz, Judge, with whom Rich, Judge, joins, dissenting with opinion.

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**Attorneys:**

Arthur H. Seidel, Thomas W. Ehrmann, and Quarles & Brady, all of Milwaukee, Wis., for appellant.

Joseph F. Nakamura (R. D. Edmonds, of counsel) for Commissioner of Patents and Trademarks.

**Judge:**

Before Markey, Chief Judge, Rich, Baldwin, and Miller, Associate Judges, and Herbert N. Maletz, \* Associate Judge, United States Customs Court.

**Opinion Text**

**Opinion By:**

Baldwin, Judge.

This is an appeal from a decision of the Patent and Trademark Office (PTO) Board of Appeals (board) affirming the rejection of claims 1, 2 and 3 of an application for "Rotating Biological Contactor Apparatus" <sup>1</sup> as obvious under 35 USC 103 in view of El-Naggar. <sup>2</sup> We reverse.

### The Invention

Appellant claims a wastewater treatment device in which wastewater is continuously passed through a tank. Semi-immersed contactors (disks) are continuously rotated to aerate their immersed portions and thereby to aerate both microorganisms that grow on the contactors and the wastewater itself. For this discussion, several variables are important in this device. "Throughput" is the volume of wastewater per unit time (gal./day) which the device must treat. "Contactor area" is the total area of the contactors which is exposed to the wastewater as the contactors are rotated (sq. ft.). "Tank volume" is the actual volume of liquid in the tanks in which the contactors rotate (gal.). The ratio of throughput to contactor area (gal./day/sq. ft.) is called the "hydraulic loading." Two concepts of effectiveness of the equipment are important in this discussion. The primary prior art reference uses the term "efficiency" to denote the percent impurity reduction which a given set-up of the device achieves and we shall so use the term. Appellant uses the term "maximum treatment capacity" to denote when a *unit of contactor area* is providing maximum "efficiency" for a given "throughput" or maximum "throughput" for a given "efficiency." It is essential to understand the distinction between "efficiency," a matter of ultimate effectiveness independent of the efficiency of the equipment, and "treatment capacity," a matter of the efficiency or effectiveness of a unit of contactor area. The latter is more properly associated with the normal use of the term "efficiency" denoting maximum result from a limited resource.

Appellant's claimed device has a ratio of tank volume to contactor area of 0.12 gal./sq. ft. <sup>3</sup> Appellant maintains that this ratio is the most desirable or optimum for all set-ups of the device in the sense that using a lower value gives lower "treatment capacity" and using a greater value gives no increase in "treatment capacity," merely increasing costs. Thus, the value is optimum in that it maximizes "treatment capacity" so that the effectiveness of a given contactor is maximized.

### The Prior Art

El-Naggar teaches the basic structure of the device claimed by appellant but is silent regarding quantitative design parameters other than to give data on a single example, which data was apparently complete *except for any discussion of "tank volume."* El-Naggar stated the "efficiency" (obviously referring to the purity of the output) could be increased to 95% by increasing the area of the contactor.

### The Rejection

The examiner rejected the claims as obvious under 35 USC 103, noting that the basic device in question is old as taught by El-Naggar. While the ratio of tank volume to contactor area of 0.12 gal./sq. ft. is not disclosed in El-Naggar, the examiner reasoned that the disclosure of El-Naggar would make a device with that optimum value obvious. The examiner noted that El-Naggar suggests increasing the "efficiency" (degree of purification) of his device by increasing the contactor area while apparently keeping the "throughput" constant, that is, reducing the "hydraulic loading." The examiner then *assumed* that El-Naggar teaches keeping the

tank volume constant while increasing the contactor area. Thus, the examiner argued that the idea of increasing tank volume to surface area to increase efficiency is taught and that working out the value for optimum efficiency is mere mechanical experimentation. The board accepted the examiner's reasoning.

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## Opinion

[1]In determining whether the invention as a whole would have been obvious under 35 USC 103, we must first delineate the invention as a whole. In delineating the invention as a whole, we look not only to the subject matter which is literally recited in the claim in question (the ratio value) but also to those properties of the subject matter which are inherent in the subject matter *and* are disclosed in the specification. In *re Davies*, 475 F.2d 667, 177 USPQ 381 (CCPA 1973). In this case, the invention as a whole is the ratio value of 0.12 *and* its inherent and disclosed property. That property is that the described devices designed with the ratio will maximize treatment capacity regardless of the values of the other variables in the devices. Just as we look to a chemical and its properties when we examine the obviousness of a composition of matter claim, it is this invention *as a whole*, and not some part of it, which must be obvious under 35 USC 103. Cf. *In re Papesch*, 50 CCPA 1276, 315 F.2d 381, 137 USPQ 43 (1963).

[2]The controlling question is simply whether the differences (namely the value of 0.12 and its property) between the prior art and appellant's invention as a whole are such that appellant's invention as a whole would have been obvious. The answer is no. It is impossible to recognize, from the experiment taught by El-Naggar, that "treatment capacity" is a function of "tank volume" or the tank volume-to-contactor area ratio. Recognition of this functionality is essential to the obviousness of conducting experiments to determine the value of the "tank volume" ratio which will maximize treatment capacity. Such functionality can *only be determined* from data representing either efficiency at varying tank volume, fixed throughput, and fixed contactor area or throughput at varying tank volume, fixed efficiency, and fixed contactor area. Each of these experiments represents treatment capacity with fixed contactor area but varying tank volume. This sort of experiment would not be suggested by the teachings of El-Naggar since he was not trying to maximize or control "treatment capacity." The experiments suggested by El-Naggar do not reveal the property which applicant has discovered, and the PTO has provided us with no other basis for the obviousness of the necessary experiments.

[3]The PTO and the minority appear to argue that it would always be *obvious* for one of ordinary skill in the art *to try* varying *every* parameter of a system in order to optimize the effectiveness of the system even if there is no evidence in the record that the prior art recognized that particular parameter affected the result. <sup>4</sup> As we have said many times, *obvious to try* is not the standard of 35 USC 103. In *re Tomlinson*, 53 CCPA 1421, 363 F.2d 928, 150 USPQ 623 (1966). Disregard for the unobviousness of the results of "obvious to try" experiments disregards the "invention as a whole" concept of §103, In *re Dien*, 54 CCPA 1027, 371 F.2d 886, 152 USPQ 550 (1967) and In *re Wiggins*, 55 CCPA 1356, 397 F.2d 356, 158 USPQ 199 (1968), and overemphasis on the routine nature of the data gathering required to arrive at appellant's discovery, after its existence became expected, overlooks the last sentence of §103. In *re Saether*, 492 F.2d 849, 181 USPQ 36 (CCPA 1974).

[4]In *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955), the court set out the rule that the discovery of an optimum value of a variable in a known process is normally obvious. We have found exceptions to this rule in cases where the results of optimizing a variable, which was known to be result effective, were unexpectedly good. In

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*re Waymouth*, 499 F.2d 1273, 182 USPQ 290 (CCPA 1974); *In re Saether*, supra. This case, in which the parameter optimized was not recognized to be a result-effective variable, is another exception. The decision of the board is reversed.

### **Footnotes**

Footnote 1.

Serial No. 331,796, filed February 12, 1973.

Footnote 2. "Method of Treatment of Sewage by Bio-Oxidation and Apparatus Therefor," U.S. Patent No. 3,335,081, issued August 8, 1967.

Footnote 3. Claims 1 and 2 recite "at least about 0.12" while claim 3 recites "about 0.12."

Footnote 4. The precise nature of the El-Naggar experiment and the nature of the data which would result are rendered hopelessly speculative by El-Naggar's total failure to discuss the critical matter of what is done with the volume of the tank. The PTO appears to assume, as a necessary element of its conclusion, that appellant's ratio is the inevitable result of El-Naggar experiment, and that the tank volume is fixed, apparently because El-Naggar does not suggest changing the tank as additional contactor area is supplied. Even if the same tank were used, the actual liquid volume of the tank could change significantly if 1) the tank has a level control, 2) the tank is not extremely large in comparison to the contactors and 3) the volume-to-area ratio of the contactors themselves is significant. Since these assumptions are not unreasonable, there is serious doubt as to the constant volume of the tank.

Whether one would inevitably arrive at the ratio value of 0.12 or above depends on facts which must be read into El-Naggar, (e.g., the volume of the tank) and on assumptions about the kind of motivation (e.g., the degree of "efficiency" which would be sought). All of this involves, at least on this record, mere speculation. Assuming, as the examiner has, that the tank volume is fixed and the natural motivation is to maximize efficiency, if El-Naggar's equipment has a tank volume to contactor area ratio of less than 0.12, and the resulting efficiency is found wanting, increasing the contactor area to increase "efficiency" will lead away from the claimed ratio.

### **Dissenting Opinion Text**

#### **Dissent By:**

Maletz, Judge, with whom Rich, Judge, joins, dissenting.

With all due respect, I cannot agree with the majority's interpretation of the El-Naggar patent.

El-Naggar discloses the same wastewater treatment apparatus as claimed, except for the specific volume-to-surface ratio of .12 gallons per square foot as recited in the claims. However, El-Naggar generally discloses varying the number of disks (column 3, lines 31-35), the number of concentric cylinders (column 4, lines 27-30), or the length of the cylinders (column 4, lines 61-62) in his apparatus in order to optimize results. Given the basic apparatus of El-Naggar and the concept of varying the number of disks in a tank in order to optimize impurity removal, I believe that it would have been well within the capabilities of the chemical engineer of ordinary skill to determine empirically, by routine experimentation, the optimum design ratio which appellant has determined and recited in his claims. That is, El-Naggar set the way, and appellant's work was what any routineer would have accomplished in following the patent teachings.

Appellant urges that the results which he determined empirically by plotting the effect of volume-to-surface ratio on impurity removal, including the specific, optimum design ratio of .12 gallons per square foot, could not have been predicted from El-Naggar. However, obviousness under 35 USC 103 does not require absolute predictability, *In re Kronig*, 539 F.2d 1300, 190 USPQ 425 (CCPA 1976), and it is sufficient here that El-Naggar clearly led the way for the routineer to arrive at the claimed apparatus.

I am in substantial agreement with the board's analysis of this case, and I would affirm the board's decision.

Footnote \* Judge of the United States Customs Court sitting by designation pursuant to 28 U.S.C. 293(d).

**- End of Case -**